

able for its intensity : it acts very largely in a contrary direction to material forces. These tend to dissipate energy : the action of the sun, the working of our machines, alike result in the conversion of energy into heat, which if not lost by radiation into space, diffuses itself about the earth, tending towards a condition of uniform temperature in which it is useless for human purposes. Coal contains energy because its carbon is held in a stressful disunion from oxygen : when the coal is burnt, these elements become united and the energy resulting from the separation is dissipated. The furnaces which turn the wheels of modern industry involve, then, a continuous loss of energy. Life, on the other hand, is always building up energy by uniting or disuniting substances which naturally tend to fly apart or come together. Conspicuous in this matter is the activity of plants : they form out of mineral substances organic tissues which, directly or indirectly, provide the whole of the animal world with its food. The most characteristic ingredient of these tissues is nitrogen. This abounds in the air; but plants cannot directly annex it. A small amount, in combined form, is brought down by rain. But vegetation mainly depends for it upon the action of the minute bacteria that have been already mentioned. These have the power of absorbing it from the air, and they yield it up to the plant roots

which ramify
in the soil around them. The peculiar
capacities
of these minute embodiments of life
ultimately
provide the living world with the
nitrogen that is
essential for its subsistence. How they
originated
remains the greatest of problems. We
may fancy.
if we please, that Life pervades the
Universe.
and under certain conditions joins
itself with
Matter—and commences its earthly
evolutionary